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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/045,948 | 10/26/2001 | Thomas Samuel Zemanian | E-13260 | 2515 |

7590 06/16/2005

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EXAMINER

METZMAIER, DANIEL S

| ART UNIT | PAPER NUMBER |
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1712

DATE MAILED: 06/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/045,948 | ZEMANIAN ET AL. | |
| | Examiner | Art Unit | |
| | Daniel S. Metzmaier | 1712 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 21-25 is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-9 and 11-20 is/are rejected.
- 7) ☒ Claim(s) 6 and 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 1-25 are pending.

Information Disclosure Statement

1. Applicants comments regarding the IDS reference are acknowledged.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-5, 7-9 and 11-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Battelle Memorial Institute, WO 0/56450. Battelle Memorial Institute (abstract, examples and claims) disclose treating mesoporous materials with silanes under supercritical conditions to form monolayers. While the materials are characterized in the reference as mesoporous silica, the claims set forth ceramic oxide aerogels. The structure of both ceramic oxide aerogels and metoporous silica are the porous silicates and have not been shown to be distinct.
4. Claims 1-5 and 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Cabot Corp, WO 99/36355. See abstract and claims. The claimed characterization of a monolayer would have been inherent to the Cabot Corp reference since all available surface groups would have reacted to form the hydrophobic silica.
5. Claims 1-5 and 7-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Hrubesh et al, US 6,005,012. See abstract, examples and claims. The claimed

characterization of a monolayer would have been inherent to the Hrubesh et al reference since all available surface groups would have reacted to form the hydrophobic silica.

6. Claims 1-4 and 7-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Teicher et al, US 3,562,177. See abstract, examples and claims. The claimed characterization of a monolayer would have been inherent to the Teicher et al compositions since all available surface groups would have reacted to form the ammonium coated silica.

Allowable Subject Matter

7. Claims 6 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Claims 21-25 allowed.

9. The following is a statement of reasons for the indication of allowable subject matter: See paragraph number 8 of the Office Action mailed September 11, 2003.

Response to Arguments

10. Applicant's arguments filed February 22, 2005 have been fully considered but they are not persuasive.

11. Applicants (pages 3 and 4) assert the application of art disclosing mesoporous gels cannot be applied to the claims directed to aerogels. Applicants further assert the examiner has not met the burden of showing the mesoporous materials of the prior art indistinct from the claims.

This has not been deemed probative for the following reason. (1) Applicants' claims (see claim 1) set forth an aerogel having a monolithic coating wherein the aerogel can be ceramic oxide (claim 2), including silica (claim 3). Applicants assert the mesoporous materials have a uniform pore size of 2 to 50 nm (20 Å to 500 Å) in diameter and the aerogels have a non-homogeneous pore distribution, which the claims (see at least claims 6 and 10) set forth as 150 Å to 250 Å (15-25 nm) with bottlenecks of 110 Å to 150 Å (11 to 15 nm). Furthermore, the examiner is unable to find any reference in the background of the invention to mesoporous materials.

(2) Applicant sets forth conclusions from the description in the background of the invention that the prior art methods for the self-assembled monolayers works for other materials but which destroys aerogels. The examiner is unable to find any reference in the background of the invention to mesoporous materials.

(3) The instantly claimed aerogels and the mesoporous materials have overlapping pore sizes, are both dried with supercritical fluids with treatment of a silane. The final products both have a gel structure having air filled pores of overlapping size and a mono-layer coating of a silane-compounds.

Applicants (page 3, lines 10 et seq) set forth that "mono-layer coating" means the surface area or a portion of surface area are coated.

The claims (see claim 1) merely set forth an aerogel without other limitation thereon. During examination claims are given their broadest reasonable interpretation.

The claims do not distinguish over the prior art based on the asserted difference between the mesoporous materials of the prior art and the claimed aerogels.

Art Unit: 1712

12. Applicants (pages 4 and 5) assert the Cabot reference fails to inherently form a monolayer since Table 1 on page 14 shows a variation of surface coatings for fumed silica. This has not been deemed persuasive because: (1) applicants (page 3, lines 10 et seq) set forth that "mono-layer coating" means the surface area or a portion of surface area are coated. (2) Furthermore, comparing applicants table bridging pages 9 and 10 of the instant specification shows variations also. (3) Claim 3 of the Cabot reference specifically provides for the use of silica aerogels. (4) Attention is further directed to MPEP 2112, "[T]he PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his [or her] claimed product."

13. Applicants (page 5) assert Hrubesh et al fails to disclose a mono-layer since there are defects in the layer as shown in the figure having free hydroxyl groups and the alkyl groups do not cross-link. This has not been deemed persuasive since applicants (page 3, lines 10 et seq) set forth that "mono-layer coating" means the surface area or a portion of surface area are coated.

Furthermore, the formation of a hydrophobic surface is not deemed to be inconsistent with the formation of a mono-layer coating.

14. Applicants Set forth substantially the same arguments to traverse the Teicher et al reference as set forth above for the Cabot and/or the Hrubesh et al reference. Said arguments have been addressed above.

Applicants further (page 6) assert that Teicher et al clearly states 4 to 12 silanol groups per nm². It is concluded that the formation of a mono-layer cannot be inherent.

Applicants (page 3, lines 10 et seq) set forth that "mono-layer coating" means the surface area or a portion of surface area are coated. Applicants' reliance on case law is misplaced since the claims broadly encompass the prior art.

15. Applicants pages 6 and 7) assert the examiner has not addressed the dependent claim limitations. Said limitations in the dependent claims are disclosed in the references. To the extent applicant believes a particular limitation distinguishes the prior art, said limitations should be so stated.

Conclusion

16. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel S. Metzmaier whose telephone number is (571) 272-1089. The examiner can normally be reached on 9:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Daniel S. Metzmaier
Primary Examiner
Art Unit 1712

DSM